In the claims:

1. A method for forming a layer of underfill adhesive on integrated circuits formed on a wafer, the integrated circuits having electrically conductive pads exposed on an active surface of the wafer, the method comprising:

forming solder bumps on the electrically conductive pads;

depositing underfill adhesive on the active surface of the wafer; and

curing the underfill adhesive.

2. The method as recited in claim 1 further comprising singulating the integrated circuits from the wafer wherein at least one of the singulated integrated circuits is a flip chip integrated circuit suitable for encapsulation in a flip chip package.

3. The method of claim 1, wherein the curing the underfill adhesive after depositing the underfill involves only partially curing the underfill adhesive without fully curing the underfill adhesive so that the underfill adhesive may be further cured when the associated solder bumps are reflowed to electrically connect the integrated circuits to substrates respectively.

4. The method of claim 1, wherein the underfill adhesive includes one or more of the following components: an epoxy resin, a hardener, a catalyst initiator, a coloring dye, and an inorganic filler.

5. The method of claim 1, wherein the underfill adhesive has a coefficient of thermal expansion substantially similar to a substrate or external device upon which the integrated circuits are mounted.

6. The method of claim 3, wherein the underfill adhesive is deposited on the active surface of the wafer at a pre-cured height such that the solder bumps are exposed through the underfill adhesive after the partial curing.

7. The method of claim 6, wherein the pre-cured height of the underfill adhesive applied to the wafer ranges from 140% to 90% of the height of the solder bumps.

8. The method as recited in claim 2, further comprising:

aligning selected ones of the solder bumps of the flip chip to corresponding bond pads included on a substrate upon which the flip chip is to be mounted;

mounting the flip chip integrated circuit on the substrate such that each of the selected solder bumps are in direct contact with the corresponding substrate bond pad; and

reflowing the solder bumps such that the flip chip bond pads are electrically connected to the corresponding substrate bond pads.

9. A method as recited in claim 1, wherein the underfill material is applied using stencil printing.

10. A method as recited in claim 1, wherein the underfill material is applied using one selected from the group consisting of screen printing, molding and spin-on deposition processes.

11. A method as recited in claim 1, wherein the underfill adhesive is selected from the group comprising: epoxies, poly-imides, silicone-polyimide copolymers.

12. The method of claim 1, wherein the underfill adhesive has a coefficient of thermal expansion in the range of approximately 20 x 10^{-6}/K to approximately 30 x 10^{-6}/K @ 25 ^{0}C.

13. The method of claim 1, wherein the underfill adhesive melts at between 120 to 140 degrees C and reacts at between 175 to 195 degrees C.

14. The method of claim 1, wherein the underfill adhesive has an elastic modulous in the range of 1 to 10 GPa.

15. The method of claim 1, further comprising forming a dam around the periphery of the wafer to prevent the underfill material deposited onto the active surface of the wafer from flowing off the wafer before the partial curing of the adhesive layer.

16. The method of claim 8, wherein a solder paste is provided on the bond pads of the substrate prior to mounting the flip chip.

17. The method of claim 8, wherein a fluxing material is provided on the substrate prior to mounting the flip chip.

18. The method of claim 1, wherein the underfill adhesive includes at least one of the following properties: a specificity of gravity ranging from 1.0 to 1.2; a solvent content ranging from 20% to 40%. a cure time of 20 to 30 minutes at 100 to 130 degrees C; and a filler content of 1% to 10% by weight.

Sub B1 19. An apparatus, comprising:

a flip chip integrated circuit having flip chip bond pads with solder bumps formed thereon an active surface of the flip chip; and

a substantially uniform layer of at least partially cured underfill adhesive formed on the active surface of the flip chip integrated circuit.

20. The apparatus of claim 19, wherein the underfill adhesive includes one or more of the following components: an epoxy resin, a hardener, a catalyst initiator, a coloring dye, and an inorganic filler.

Sub B2 21. The apparatus of claim 19, wherein the underfill adhesive has a coefficient of thermal expansion substantially similar to that of a substrate upon which the flip chip integrated circuit is intended to be mounted.

22. The apparatus of claim 19, wherein the underfill adhesive is deposited on the active surface of the flip chip integrated circuit at a pre-cured height such that the solder bumps are at least exposed through the underfill adhesive after the partial curing.

23. The apparatus of claim 22, wherein the pre-cured height of the underfill adhesive applied to the wafer ranges from 140% to 90% of the height of the solder bumps.

24. The apparatus of claim 19, wherein the underfill adhesive layer is deposited on the active surface of the flip chip integrated circuit in wafer form flip chip integrated circuit is singulated from the wafer.

25. A apparatus of claim 19, wherein the underfill adhesive is selected from the group comprising: epoxies, poly-imides, silicone-polyimide copolymers.

26. The apparatus of claim 19, further comprising:

a substrate having a plurality of contact pads, the contact pads configured to contact the solder bumps of the flip chip when the flip chip is mounted onto the substrate, the contact pads and the solder bumps forming joints electrically connecting the flip chip to the substrate.

27. The apparatus of claim 26, wherein the underfill adhesive material is fully cured when the solder bumps of the flip chip and the contact pads of the substrate are reflowed.

28. A apparatus claim 19, wherein the layer of underfill adhesive is substantially opaque thereby protected the flip chip integrated circuit from photo induced leakage currents by blocking visible light.

29. The apparatus of claim 19, wherein the underfill adhesive has a coefficient of thermal expansion in the range of approximately 20 x 10^{-6}/K to approximately 30 x 10^{-6}/K @ 25 ^{0}C.

30. The apparatus of claim 19, wherein the underfill adhesive melts at between 120 to 140 degrees C and reacts at between 175 to 195 degrees C.

31. The apparatus of claim 19, wherein the underfill adhesive has an elastic modulous in the range of 1 to 10 GPa.

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32. The apparatus of claim 19, further comprising a dam around the periphery of the wafer to prevent the underfill material deposited onto the active surface of the wafer from flowing off the wafer before the partial curing of the adhesive layer.

33. The apparatus of claim 26, wherein a solder paste is provided on the bond pads of the substrate prior to mounting the flip chip.

34. The apparatus of claim 26, wherein a fluxing material is provided on the substrate prior to mounting the flip chip.